

II. Amendments (including status) of the Claims

Claim 1. (Currently Amended) A semiconductor module, comprising:

a wiring substrate on which wiring is formed;

a semiconductor device mounted on said wiring substrate and

electrically connected to the said wiring formed on said wiring substrate; and

~~an external connection terminal arranged on the semiconductor device mounted side of said wiring substrate so as to be a connected portion between said wiring and the outside electrically connected the wiring,~~

~~wherein there is formed an insulating resin layer thicker than said semiconductor device between said wiring substrate and said external connection terminal~~

an external connection terminal electrically connected to said wiring,
said external connection terminal arranged on a same side of said wiring substrate to which said semiconductor device is mounted; and

an insulating resin layer, said insulating resin layer having a thickness greater than said semiconductor device, provided between said wiring substrate and said external connection terminal and functioning to relax stress between said semiconductor module and a board to which the semiconductor module is mounted.

Claim 2. (Currently Amended) A semiconductor module, comprising:

a wiring substrate on which wiring is formed;

a semiconductor device mounted on said wiring substrate and

electrically connected to the said wiring formed on said wiring substrate; and

~~an insulating resin layer formed on the semiconductor device mounted side of said wiring substrate and having an inclined portion at a given inclination to the mounting surface and a flat portion which is almost flat and provided for an~~

~~arrangement of the external connection terminal to be an externally connected portion,~~

~~wherein a part of the wiring is formed on the inclined portion of said insulating resin layer for an electrical connection between said wiring and said external connection terminal~~

an external connection terminal electrically connected to said wiring,
said external connection terminal arranged on a same side of said wiring substrate
to which said semiconductor device is mounted, and

an insulating resin layer formed on the same side of said wiring
substrate to which said semiconductor device is mounted,

wherein said insulating resin layer has an inclined portion and a flat
portion on which said external connection terminal is arranged, said insulating resin
layer functioning to relax stress between said semiconductor module and a board to
which said semiconductor module is mounted, and

wherein a part of said wiring electrically connected between a terminal
on said semiconductor device and said external connection terminal is formed on
said inclined portion of said insulating resin layer.

Claim 3. (Original) A semiconductor module according to claim 1 or claim 2,
wherein said insulating resin layer is formed by mask printing.

Claim 4. (Currently Amended) A semiconductor module, comprising:

a wiring substrate on which wiring is formed;

a semiconductor device mounted on said wiring substrate and
electrically connected to the said wiring formed on said wiring substrate;

~~an insulating resin layer formed by mask printing on the semiconductor~~

~~device mounted side of said wiring substrate; and~~

~~an external connection terminal to be a connected portion between the wiring and the outside electrically connected to said wiring on said insulating resin layer.~~

an insulating resin layer having a function of relaxing stress, between said semiconductor module and a board to which said semiconductor module is mounted; and

an external connection terminal on said insulating resin layer and electrically connected to said wiring.

wherein a plurality of said insulating resin layers are collectively formed on a same side of said wiring substrate to which said semiconductor device is mounted by printing insulating material with a mask on a board comprising a plurality of said wiring substrates.

Claim 5. (Currently Amended) A semiconductor module according to claim 1 or claim 2, wherein said insulating resin layer ~~has a shape of almost enclosing~~ substantially encloses said semiconductor device.

Claim 6. (Original) A semiconductor module according to claim 5, wherein said insulating resin layer is frame-shaped.

Claim 7. (Currently Amended) A semiconductor module according to claim 5, wherein an inclination of an inner circumferential side is ~~gentler than~~ relatively gradual to that of an outer circumferential side of said insulating resin layer.

Claim 8. (Original) A semiconductor module according to claim 1, wherein a plurality of insulating resin layers are used instead of said insulating resin layer and arranged as if they enclose said semiconductor device.

Claim 9. (Original) A semiconductor module according to claim 1, wherein said wiring substrate is a silicon substrate or a glass substrate.

Claim 10. (Currently Amended) A semiconductor module according to claim 1, wherein said insulating resin layer ~~may be~~ is made of an insulating material having an elastic modulus from within the range of approx. 0.1Gpa to approx. 10Gpa.

Claim 11. (Original) A semiconductor module according to claim 1, wherein a film thickness of said insulating resin layer is approx. 10 μ m to approx. 350 μ m.

Claim 12. (Currently Amended) A semiconductor module according to claim 1, wherein said semiconductor device ~~may be~~ is one of a semiconductor chip, a chip scale package (CSP), a ball grid array (BGA), and an wafer-level CSP.

Claim 13. (Original) A semiconductor module according to claim 1, wherein a sum of a thickness of said insulating resin layer and a height of said external connection terminal is greater than a distance from the mounted surface of said semiconductor device to a rear surface thereof.

Claim 14. (Currently Amended) A semiconductor module according to claim 1, wherein a sum of a thickness of said insulating resin layer and a height of said external connection terminal is ~~almost~~ substantially equal to a distance from the

mounted surface of said semiconductor device to the rear surface thereof.

Claim 15. (Currently Amended) A semiconductor module, comprising:

a wiring substrate on which wiring is formed;

a semiconductor device electrically connected to the said wiring
~~formed on said wiring substrate through bumps~~ via a bump of said semiconductor
device; and

~~an external connection terminal to be a connected portion between the~~
~~wiring and the outside electrically connected to said wiring;~~

~~wherein the semiconductor device is mounted on the wiring substrate~~
~~without using an underfill; and~~

~~wherein the semiconductor device comprises a semiconductor chip~~
~~and the wiring substrate comprises a silicon substrate~~

an external connection terminal electrically connected to said wiring,
said external connection terminal arranged on a same side of said wiring substrate
to which said semiconductor device is mounted; and

an insulating resin layer formed on the same side of said wiring
substrate on which said semiconductor device is mounted,

wherein said insulating resin layer has a function of relaxing stress
between said semiconductor module and a board to which said semiconductor
module is mounted, and

wherein said wiring substrate is a silicon substrate.

Claim 16. (Currently Amended) A semiconductor module, comprising:

a wiring substrate on which wiring is formed;

a semiconductor device electrically connected to the wiring ~~formed on~~

~~said wiring substrate through bumps~~ via a bump of said semiconductor device; and
~~an external connection terminal to be a connected portion between the~~
~~wiring and the outside electrically connected to said wiring,~~
~~wherein the semiconductor device is mounted on said wiring substrate~~
~~without using an underfill; and~~
~~wherein an insulating resin layer is formed between the semiconductor~~
~~chip of said semiconductor device and the bumps~~
an external connection terminal electrically connected to said wiring,
said external connection terminal arranged on a same side of said wiring substrate
to which said semiconductor device is mounted,
wherein said semiconductor device has an insulating resin layer
having a function of relaxing stress between said semiconductor device and said
wiring substrate to which said semiconductor device is mounted, said
semiconductor device being mounted on said wiring substrate without using an
underfill.

Claim 17. (Currently Amended) A semiconductor module, comprising:

a wiring substrate on which wiring is formed;
a semiconductor device electrically connected to the wiring ~~formed on~~
~~said wiring substrate through bumps~~ via a bump of said semiconductor device; and
~~an external connection terminal to be a connected portion between the~~
~~wiring and the outside electrically connected to said wiring,~~
~~wherein the semiconductor device is mounted on said wiring substrate~~
~~without using an underfill; and~~
~~wherein an insulating resin layer is formed between the wiring~~
~~connected to the bumps of said semiconductor device and said wiring substrate~~

an external connection terminal electrically connected to said wiring,
said external connection terminal arranged on a same side of said wiring substrate
to which said semiconductor device is mounted;

a first insulating resin layer formed on the same side of said wiring
substrate to which said semiconductor device is mounted, said first insulating resin
layer having a function of relaxing stress between said semiconductor module and a
board to which said semiconductor module is mounted, and

wherein said semiconductor device has a second insulating resin layer
having a function of relaxing the stress between said semiconductor device and said
wiring substrate to which said semiconductor device is mounted, said
semiconductor device being mounted on said wiring substrate without using an
underfill.

Claim 18. (Currently Amended) A semiconductor module according to claim 16,
wherein said insulating resin layer is made of an insulating material having an
elastic modulus from within the range of approx. 0.1Gpa to approx. 10Gpa.

Claim 19. (Original) A semiconductor module according to claim 16, wherein a film
thickness of said insulating resin layer is approx. 10 μ m to approx. 350 μ m.

Claim 20. (Original) A semiconductor module according to claim 16, wherein said
insulating resin layer is formed by mask printing.

Claim 21. (Currently Amended) A semiconductor module according to claim 16,
wherein said external connection terminal is formed on a second insulating resin
layer, which is formed on said semiconductor device mounted side of said wiring

substrate, having an inclined portion at a given inclination to the mounting surface and ~~an almost~~ a substantially plane flat portion on which said external connection terminal is arranged.

Claim 22. (Withdrawn)

Claim 23. (Currently Amended) A mounting structure, comprising a semiconductor module, a heat conductive material and an external substrate to which said semiconductor module is mounted,

wherein said semiconductor module includes:

a wiring substrate on which wiring is formed;

a semiconductor device mounted on said wiring substrate and electrically connected to said wiring;

an external connection terminal electrically connected to said wiring, said external connection terminal arranged on a same side of said wiring substrate to which said semiconductor device is mounted; and

an insulating resin layer, said insulating resin layer having a thickness greater than said semiconductor device, provided between said wiring substrate and said external connection terminal and functioning to relax stress between said semiconductor module and a board to which the semiconductor module is mounted, and

wherein a said heat conductive material layer is formed on ~~an~~ said external substrate ~~on to which the said semiconductor module according to claim 4 is mounted~~ and a said semiconductor device of said semiconductor module is connected to the said heat conductive material layer.

Claim 24. (Currently Amended) A semiconductor module according to claim 1, further comprising a metal member connecting said semiconductor device to said a circuit board.

Claim 25. (Original) A semiconductor module according to claim 1, wherein said semiconductor device is connected to said wiring substrate by die-attaching and said semiconductor device is electrically connected to the wiring formed on said wiring substrate by wire bonding.

Claim 26. (Currently Amended) A semiconductor module, comprises:

a wire substrate on which wiring is formed;

a semiconductor device electrically connected to the wiring formed on said wiring substrate;

an insulating material covering said semiconductor device; and

an external connection electrode ~~to be a~~ for enabling electrical connection ~~connected portion~~ between wiring formed on said insulating material and ~~an outside~~ that located external to said semiconductor module.

Claim 27. (Original) A semiconductor module according to claim 26, wherein there is provided an intermediate plate in the insulating material between said semiconductor device and said external connection terminal.

Claim 28. (Canceled)

Claim 29. (Canceled)